

CLAIMS:

1. A method of manufacturing a stent by cutting a desired pattern in a tube comprising the steps of:
 - i. providing a tube having a longitudinal axis therethrough;
 - ii. providing a stationary source of laser radiation;
 - iii. generating a beam of laser radiation using the source of laser radiation;
 - iv. cutting a desired pattern into the tube by scanning the beam over a desired region of the tube.
2. The method of claim 1 wherein during the cutting step the beam is scanned in a circumferential direction by pivoting a first scanning mirror in the path of the beam about a first axis and by pivoting a second mirror in the path of the beam about a second axis, the first and second axes orthogonal to one another and orthogonal to the longitudinal axis of the tube, the first and second mirrors redirecting the beam.
3. The method of claim 2 wherein the tube is translated in a longitudinal direction relative to the beam during the cutting step.
4. The method of claim 1 wherein during the cutting step, the beam is deflected about a first axis and about a second axis, the first and second axes orthogonal to one another and orthogonal to the longitudinal axis of the tube.
5. The method of claim 4 wherein the beam is deflected about the first and second axis using a single mirror which may be pivoted about the first and second axes.
6. The method of claim 4 wherein the beam is deflected about the first axis by pivoting a first mirror about the first axis and the beam is deflected about the second axis by pivoting a second mirror about the second axis
7. The method of claim 1 wherein the laser beam is a pulsed, the laser pulses having a duration of 100 ns or less.
8. The method of claim 5 wherein the laser pulses have a duration of 100 ps or less.
9. The method of claim 5 wherein the laser beam is characterized by a repetition rate of 25 kHz or greater.
10. The method of claim 5 wherein the laser beam is characterized by a pulse power of 10^8 W/cm² or greater.

11. The method of claim 6 wherein the laser beam is characterized by a repetition rate of 25 kHz or greater and the laser beam is characterized by a pulse power of 10^8 W/cm² or greater.
12. The method of claim 5 wherein the wavelength of the laser beam is 600 nm or less.
13. The method of claim 1 wherein the wavelength of the laser beam is 355 nm or less.
14. The method of claim 1 comprising the step of polishing the stent after the cutting step.
15. A method of providing one or more openings in a tube for use in manufacturing a medical device by cutting a desired pattern in the tube comprising the steps of:
 - i. providing a tube having a longitudinal axis therethrough;
 - ii. providing a stationary source of laser radiation;
 - iii. generating a beam of laser radiation using the source of laser radiation;
 - iv. cutting a desired pattern into the tube by scanning the beam over a desired region of the tube.
16. The method of claim 15 wherein the medical device is a stent.
17. The method of claim 15 wherein the medical device is a catheter.
18. The method of claim 17 wherein the tube forms a catheter sheath or catheter bumper.
19. The method of claim 15 wherein during the cutting step the beam is scanned in a circumferential direction by pivoting a first scanning mirror in the path of the beam about a first axis and by pivoting a second mirror in the path of the beam about a second axis, the first and second axes orthogonal to one another and orthogonal to the longitudinal axis of the tube, the first and second mirrors redirecting the beam.